Managing difficult behaviour in horses

InPractice

Managing the difficult horse for veterinary procedures

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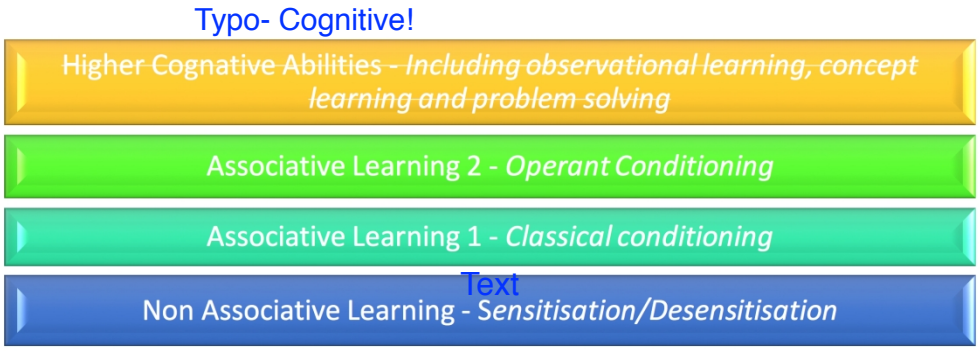
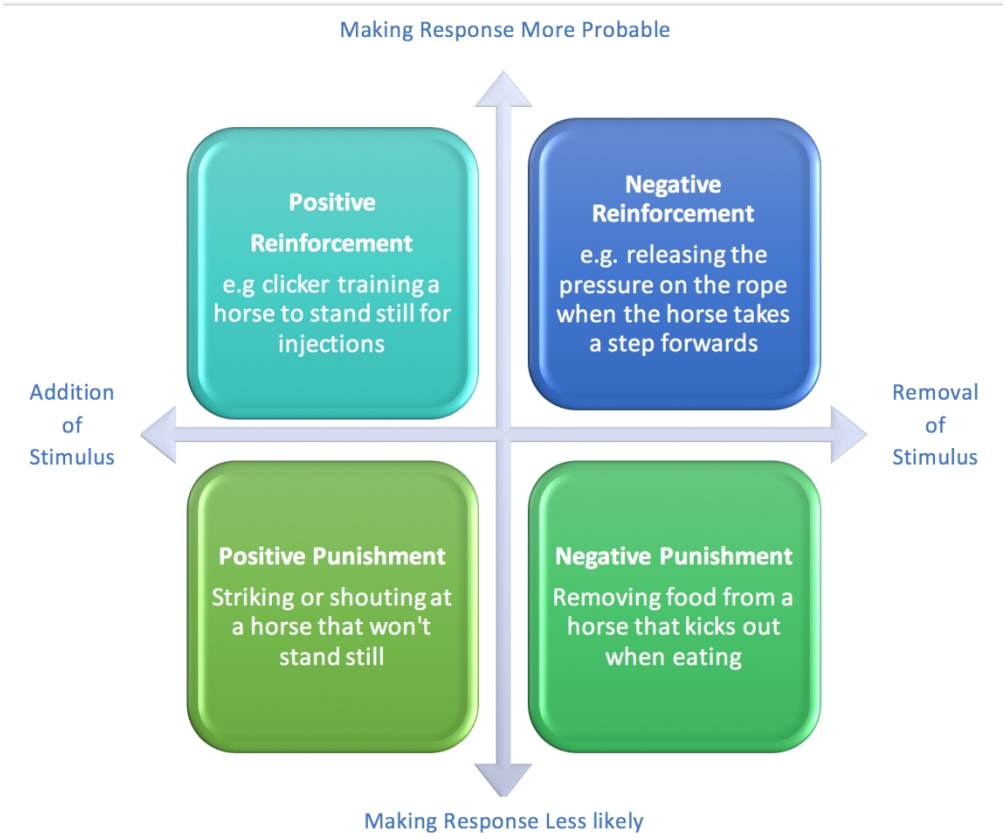


Figure 1: Different species have differing levels of cognitive ability. Whilst horses are able to learn through basic learning processes they do not possess the higher cognitive abilities required for abstract thought processes, planning or problem solving.



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eyelid

Figure 4: As the needle is placed the arousal levels have increased, note the elevation of the head, increased tension around the eye and positioning of ears.

108x78mm (220 x 220 DPI)

Figure 5: Now the arousal levels are markedly elevated: the head position has elevated further and increased tension is evident from the position of the ears and especially the eye. The horse has also moved round a few steps from its original position and so transitioned from freeze to flight

253x238mm (144 x 144 DPI)

Figure 6: Don’t walk straight up the horse and place your cold stethascope onto the axilla.

61x48mm (220 x 220 DPI) Stethoscope

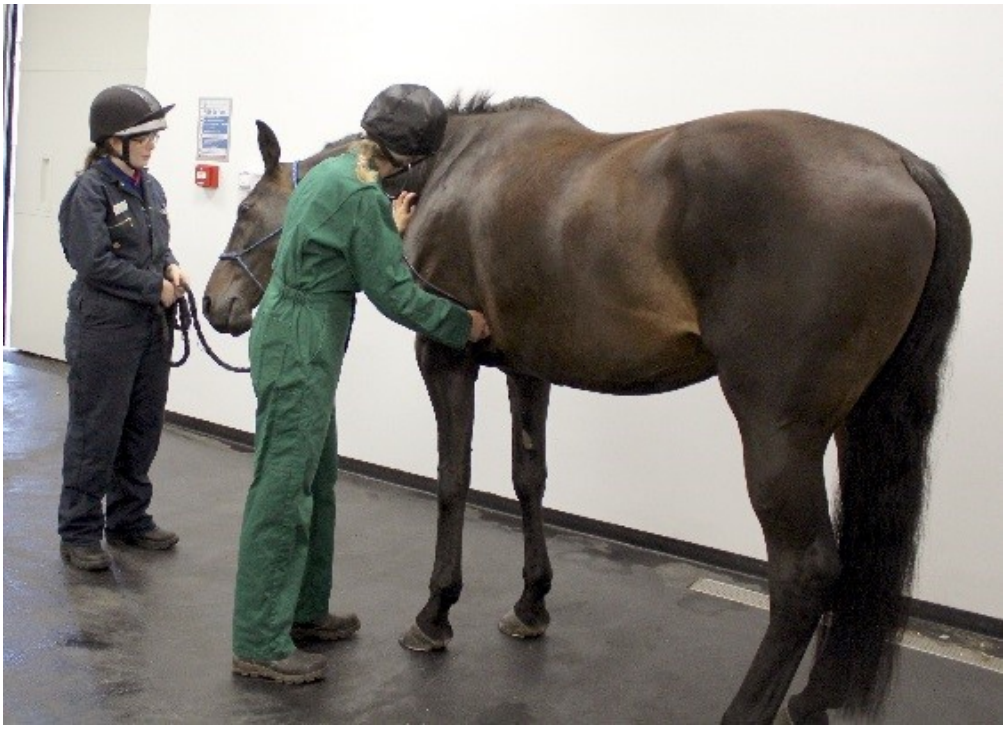

Figure 7; Instead approach the horse and start by scratching the wither/neck region with your left hand. Next run the back of your hand down to the axilla before turning it round to place the stethoscope.

64x46mm (220 x 220 DPI)

Figure 8: Don’t make your first contact with the horse be placing your stethoscope on the sensitive flank area. If the horse jumps you may get kicked

98x67mm (220 x 220 DPI)

76x50mm (220 x 220 DPI)

Figures 9 &10; Instead start by placing your right hand on the neck and scratching. Then stroke using the back of your left hand before turning it over to place the stethoscope. Note also the safer positioning if the horse did kick out.

75x50mm (220 x 220 DPI)

Figure 11: Don’t go from no contact to trying to grasp the upper lip, as well as potentially startling the horse if they throw their head back this behaviour will very quickly become reinforced.

99x106mm (220 x 220 DPI)

58x48mm (220 x 220 DPI)

48x58mm (220 x 220 DPI)

be slid

Figures 12-14; Instead start by stroking your hand down the cheek, the thumb can then by slid under the upper lip and lift it to assess the mucous membranes. If the horse does lift their head you are more likely to keep your hand in contact, thus not reinforcing the head lift.

49x57mm (220 x 220 DPI)

Figure 15; Again if the first thing the horse feels of the syringe is contact with the lips in an upwards direction they will not only find this aversive but if they throw their head back it will be impossible to keep the syringe in contact with the lips – negatively reinforcing the unwanted behaviour

89x96mm (220 x 220 DPI)

53x53mm (220 x 220 DPI)

74x75mm (220 x 220 DPI)

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89x71mm (220 x 220 DPI)

Figure 19; Grasping the tail and trying to insert the thermometer like this can be aversive and if the horse kicks you are stood in a precarious position

110x73mm (220 x 220 DPI)

standing NOT stood!

101x67mm (220 x 220 DPI)

with

Figures 20-21; Instead stand close to the horses side, again you can scratch the wither your left hand. Slide your right hand back and start to scratch the area of hairless skin below the tail; this inevitably results in the horse voluntarily lifting the tail at which point you can easily insert the thermometer whilst still scratching the skin in the perineal region. Many horses thoroughly enjoy this!

101x67mm (220 x 220 DPI)

In Practice MCQs – Gemma Pearson Managing the difficult horse

1) Non Associative Learning:
    a. Helps increase an animals predictability of the environment
    b. Helps increase an animals controllability of the environment
    c. Explains how animals become sensitised or desensitised to a stimulus
    d. Is an example of a higher learning process horses are not capable of

2) Which of the following scenario correctly describes negative reinforcement
    a. Striking a horse that bites someone to discourage it from biting again in the future
    b. Releasing the pressure on the lead rope when the horse steps forward if it was refusing to walk into an exam room
    c. Removal of feed from a horse that is pawing to discourage the behaviour
    d. Clicker training the horse to tolerate injections
3) Which of the following scenarios correctly describes positive reinforcement
    a. Striking a horse that bites someone to discourage it from biting again in the future
    b. Releasing the pressure on the lead rope when the horse steps forward if it was refusing to walk into an exam room
    c. Removal of feed from a horse that is pawing to discourage the behaviour
    d. **Clicker training the horse to tolerate injections**
4) What is the most likely explanation for a horse kicking out when you go to lift a limb
    a. The horse perceives you touching the leg to be aversive and kicking out has been negatively reinforced as it removes contact with your hand.
    b. The horse is naughty, he is obviously trying it on as he is fine with the farrier
    c. The horse has never been taught good manners and pushes his owner around so he simply does not know any better.
    d. The horse does not respect you, he is obviously trying to be dominant and so requires firm but fair handling.

Managing the Difficult Horse for Veterinary Procedures

Gemma Pearson BVMS Cert AVP (EM) MSCR MRCVS

Introduction

Equine veterinarians carry a high risk of sustaining an occupational injury, with the behaviour of the horse frequently being cited as the cause. This is not surprising considering that, in a survey of U.K. equine veterinarians, the majority report regularly treating horses that demonstrated unwanted behaviours, including those that are bargy, won't stand still, are needle shy, kick out with a hind leg or strike with a front foot on at least a monthly basis (Pearson, 2016). At the same time clients often judge a veterinarian, not on their clinical ability, but instead on their equine handling skills (Doherty, 2017). Developing skills for managing difficult horses therefore provides the opportunity to create a safer and less stressful working environment, and to leave a good impression. In this article we will discuss the processes by which horses learn and behaviour modification techniques that can be utilised in clinical practice, the scenario of the needle shy horse will be used as an example throughout.

How do Horses Learn

Training horses is based on centuries of tradition; with many common beliefs, such as leadership and dominance theories now disproved (ISES, 2016). When surveyed U.K. Equine Veterinarians were found to have a poor understanding of the processes through which horses learn (Learning Theory), whereas even a single lecture covering learning theory and its application to managing difficult horses was found to increase student's confidence when faced with such horses (Pearson, 2016).

With horses we should always describe unwanted behaviours in terms of incorrect learnt responses that have been reinforced through Operant Conditioning, rather than attribute them to being purposefully disobedient; which would suggest higher cognitive abilities horses simply do not possess see **Figure 1**

Non Associative Learning (Sensitisation and Habituation)

Whilst the veterinarian's job is to prevent, investigate and treat ill-health – not to train the horse, we need to accept that horses are always learning whether we want them to or not. The most basic form of learning is non-associative learning; when a stimulus is repeatedly presented, the horse either becomes less likely to react to it (habituation) or more likely to react to it (sensitisation). Which response occurs will depend on how aversive the horse perceives the stimulus to be, as opposed to how aversive it actually is. Perception is based on aspects such as the horse's instinctive response but also previous experiences. In human terms strong aversions to spiders, which are almost inevitably harmless, demonstrates the importance of perception of averseness. This is particularly important to consider for naive horses; by the vet investing a little more time and introducing positive experiences such as a wither scratch (see top tips box), this will increase the likelihood of the horse becoming habituated to their annual vaccine rather than sensitised leading to them becoming increasingly needle-shy in the future.

Associative Learning (Classical and Operant conditioning)

1) **Classical Conditioning** – Also known as Pavlovian conditioning after the famous digestive physiology professor who accidently discovered that if a bell was consistently rung before delivery of food the dogs he was using for his studies would salivate on hearing the bell, despite the absence of food. Classical conditioning relies on a new stimulus being consistently and repeatedly presented before an unconditioned stimulus (the one that originally elicited an innate physiological response, such as salivation) so that the animal

starts to respond to the new stimulus (now called the conditioned stimulus). Importantly Classical Conditioning offers a horse *predictability* about their environment. Practically it is utilised in clicker training, where the 'click' sound emitted by pressing the metal box is always followed immediately by a food reward. The click *predicts* the arrival of food, initiating the positive emotional response associated with it. The horse soon learns to repeat the behaviour it was performing when it heard the click. Clicker training can be a rapidly effective way for managing difficult horses.

Box 1 - **Top Tip**

When using clicker training try to think of the timing of the click as 'taking a picture of the desired behaviour' to avoid clicking after the behaviour was offered; in which case you will be rewarding a different one. **Finish – continue text**

We should also consider the alternative side of classical conditioning, for example when we give an intramuscular injection of an antimicrobial into the horse's rump we often gently tap the rump 3-4 times before placing the needle. In this scenario the tapping of the rump *predicts* the discomfort associated with needle placement, hence why many horses react negatively before needle placement is even attempted. Over time this association becomes stronger, resulting in a more intense fear response and consequently more dangerous negative behaviours performed by the horse to avoid it. Fortunately we can use a process called 'counter conditioning' to prevent or reverse this unwanted behaviour. To do this one person holds the horse with a few pellets of feed concealed in their hand. The second person taps on the rump (gently at first!) and on the 4th 'tap' food is delivered by person one without any needle placement. It will only take a few repetitions before the horse starts to *predict* food will be delivered on the 4th tap, and so when person number 2 starts thumping the horse will have a positive focus of attention on person number one. At this point person number one has a large handful of feed ready and person number two can place the needle on the 4th tap

– the larger volume of feed means the horse will still be chewing whilst the injection is slowly administered.

2) **Operant Conditioning** – In this type of learning an animal learns to '*operate'* within its environment through rewards and consequences. Operant conditioning involves an understanding of the way in which an animal is motivated to perform or to stop performing a behavioural response. The four quadrants in this type of learning involve what are termed positive and negative reinforcement and punishment. The easiest way to understand these rather confusing terms is to remember that reinforcement = making a behaviour more likely to be repeated in the future, whereas punishment = making a behaviour less likely to be trialled again. The words positive and negative as applied here don't mean good and bad but are used in the mathematical sense, i.e. Positive = the addition of something and Negative = the removal of something. see **Fig 2**

It should be pointed out at this point that punishment based handling is never recommended. Punishment is very rarely effective in the long term and has significant welfare concerns associated with it. Positive punishment on its own in particular is never recommended for the following reasons:-

- It tells the horse what not to do, but does not tell it what it should be doing instead
- Unless delivered within ½ second its effectiveness is reduced and after 2 seconds the horse may not associate it with the unwanted behaviour at all, making punishment unlikely to be effective.
- It almost always causes fear; as well as having negative welfare implications, fear inhibits learning (making it harder to train the behaviour you want) and increases the likelihood of a negative behavioural response (barging, kicking out etc.)

Remember whilst sometimes striking or growling at a horse may result in the horse standing still long enough to complete the procedure this is probably a freeze response as a result of fear. As well

as increasing the risk of the horse suddenly trialling a hyperactive negative behavioural response, which might result in injury to the vet or handler, it will form a negative association with veterinary care and the horse may become more difficult to treat over time.

Inadvertently Training the Horse to be Needle Shy

No one wants to train a horse to be needle shy, but if they rear as soon as you try to raise the vein we need to accept that someone has previously accidently reinforced that behaviour, i.e. we have trained it. This is almost always occurs via negative reinforcement; when raising the vein the horse may predict venepuncture (*classical conditioning*) and trial throwing their head back, if this results with a loss of contact with the vets hand this behaviour has just been negatively reinforced. Over time the horse will trial throwing the head back further and with more force, eventually this weight shift results in a small rear. Over time the rear will become higher and faster and they may then start to trial striking with a foreleg.

With their limited cognitive capacity, horses do not have a concept of 'winning or losing' i.e. if the vet successfully injects them on the 6th attempt they will not perceive that it will not be worth rearing in the future as they got injected in the end, instead they will remember five repetitions of successfully removing the vets injection attempt and only one where they were unsuccessful. Thus they are more likely to trial rearing next time, not through naughtiness but through inadvertent reinforcement of the wrong behaviour.

Differential Reinforcement

Many practitioners may be wondering at this point how to stop the horse rearing when they raise the vein, especially if they are advised against using punishment or physical restraint. Instead of trying to work out how to stop the unwanted behaviour it is easier to concentrate on training the desired behaviour instead, in this case standing calmly and still, which is called 'differential

reinforcement'. In this scenario we know that removing the hand reinforces rearing, so instead remove the hand when the horse is standing still and the head has not been lifted.

Shaping

Obviously you are unlikely to be able to raise the vein on this horse now without it trialling rearing, and the risk of the horse being able to remove your hand (even for a fraction of a second) is high. Shaping describes the process of breaking down the final behaviour into several small steps to make it more achievable. In this case you might initially place your hand on the wither – if the horse does not raise its head remove your hand, then place it halfway between the wither and the jugular furrow, again removing it if the horse does not react. Each time half the distance until the horse will let you place your hand on the jugular vein and raise it – initially raise it only for a fraction of a second so you can remove your hand whilst the horse has not raised its head and all four feet are firmly on the ground, each time raise for longer until the horse tolerates several seconds without moving. Then you can introduce the second hand, again initially away from the jugular groove and repeat the process until you can press the capped needle against a raised vein without the horse reacting. The horse will now think instead of having to rear to remove your hand they now need to stand calmly still (as this is the behaviour that results in the hand being removed) and so when you do inject they are very unlikely to react.

If you place your hand somewhere that does result in the horse raising their head keep your hand in contact and as soon as they start to lower their head slightly again remove your hand. Practice at this level a few times so that it does not result in a raised head before progressing. If the horse does rear you have probably gone over the threshold of what they can cope with, so go right back to something more achievable and take smaller steps to build it up again.

Motivation and Combination Reinforcement

Just as some people would be more motivated to try harder for chocolate than wine, motivation varies by individual horse. Horses that are more thinly skinned and sensitive tend to more motivated by pressure (for example removing your hand to reward standing still for an injection). On the other hand those that have been genetically selected for draft work tend to be less motivated by pressure but are often highly motivated by food. Try to identify what motivates individual horses to accelerate your training.

For most horses the combination of both works really well. So in this example when the horse stands still whilst you raise the vein simultaneously click and remove your hand, the click should always be followed by a small food reward. A clicker is considered more effective than a voice cue, probably as it is a more unique sound. However, if you struggle to juggle a clicker and a syringe, or if you need to wear sterile gloves, you can use a tongue click or a cue word such as 'good' instead. Alternatively a trained nurse or groom can be a great person to click and reward whilst holding the horse.

Arousal Levels

Arousal refers to the level of alertness or responsiveness and most unwanted responses to veterinary care (barging, kicking etc.) occur when the horse has high levels of arousal. Try to constantly monitor the horse's arousal levels as you are working with them. Clues that arousal levels are increasing include

- Elevated head position, especially if it keeps getting a few inches higher as you progress
- The eye may be rotated back and down
- The ear position is backwards or sideways and rotated down
- There is evidence of tension on the muscles of facial expression, this may be shown as elongated lips or a furrow developing around the upper eyelid

- There may be evidence of muscular tension generally, the muscles are tight when you put a hand on the horse and skin tension makes it difficult to grasp much of a skin twitch
- The forelegs become more rigidly extended (making the horse appear taller) whilst one or both hind limbs may be flexed (this gives the appearance of crouching rather than a horse resting a leg when they are relaxed)
- They may be hyper-vigilant and either focusing on the vet or potential escape routes.
- They may either be frozen still or fidgety
- If they move the steps tend to be fast and more jerky in nature

When horses have elevated arousal levels they have elevated circulating levels of adrenaline and are likely to have a hyperactive negative response to veterinary care. This would be much less likely if a few moments had been spent getting the horse more relaxed first, perhaps with a wither scratch or through combination reinforcement. Remember that elevated arousal can manifest as flight or fight but also freeze – many people think if a horse is still they are safe, but if the horse is in a freeze response and you continue they are liable to then react suddenly with either flight or fight. **See Box 2**

Box 2 – Monitoring Arousal Levels

Figure 3: Here a 'lickit' is being used to help minimise anxiety and prevent arousal levels elevating whilst the nurse prepares the stifle for diagnostic intra-articular local anaesthesia. Note some evidence of elevated arousal is already evident from eye tension creating a furrow above the upper eye. eyelid

Figure 4: As the needle is placed the arousal levels have increased, note the elevation of the head, increased tension around the eye and positioning of ears.

Figure 5: Now the arousal levels are markedly elevated: the head position has elevated further and increased tension is evident from the position of the ears and especially the eye. The horse has also moved round a few steps from its original position and so transitioned from freeze to flight

Problem solving if things aren't working

If you have tried these techniques and run into a problem it is usually down to one of the following common factors

- **Timing** - For optimal training your hand should be removed within ½ second of the desired behaviour. Especially when building duration it is tempting to hold your hand against the jugular vein for a few seconds then remove it and click just as you think the horse is about to move. Of course what you are actually reinforcing is the thought process of moving; rather than standing still for longer and longer the horse will instead move after shorter periods each time
- **Not Shaping Carefully** – If the horse reacts to the level you are at then repeat a few times or make smaller incremental steps towards your next goal. It really is the case that the more time you put into taking smaller steps at the start the faster the overall process will be. Even with difficult horses, after a bit of practice, the majority of needle shy horses will stand still to be injected after less than 30 seconds.
- **Not Monitoring Arousal** – Even if the horse does not move when you place a hand on the neck, if it is frozen still with high arousal levels it is not learning effectively when you take your hand away and may not be interested in food. Then when you do go to inject it is still likely to react. Instead try and find a level even less aversive (such as a wither scratch) and remove your hand when they start to relax, this way you will be starting to reward relaxation as well as standing still.

Can Owners Prepare their Horse for my Visit?

- Movement is often associated with increased arousal and one of the most helpful things an owner can do to set up their horse for successful veterinary care is to train it to stand still and calmly in lots of different locations so that it becomes a habit. They can also train their horse to accept veterinary procedures such as injections. See the 'Don't Break Your Vet' series of videos on YouTube or eBEVA for more information

Conclusion

Horses are large, powerful animals that can easily injure those around them. By recognising negative behavioural responses to veterinary care as incorrect learned responses, rather than intentional naughtiness, we can rapidly retrain them to accept veterinary care. This is not only less stressful for the horse, vet and owner but can promote your practice amongst the local horse owning community.

Further Boxes – some of these boxes may be combined for space efficiency. These boxes can be placed at the end of the article or spread throughout it as they are not associated specifically with any text.

Tips and Tricks Boxes

We can improve our efficiency at training horses to accept potentially aversive procedures by minimising the 'aversive' aspect of them.

Box 4 - Auscultation of Heart

Figure 6: Don't walk straight up the horse and place your cold stethascope onto the axilla.

Figure 7; Instead approach the horse and start by scratching the wither/neck region with your left hand. Next run the back of your hand down to the axilla before turning it round to place the stethoscope.

Box 5 - Auscultation of Borboygmi

Figure 8: Don't make your first contact with the horse be placing your stethoscope on the sensitive flank area. If the horse jumps you may get kicked.

Figures 9 &10; Instead start by placing your right hand on the neck and scratching. Then stroke using the back of your left hand before turning it over to place the stethoscope. Note also the safer positioning if the horse did kick out.

Box 6 - Assessing mucous membranes

Figure 11: Don't go from no contact to trying to grasp the upper lip, as well as potentially startling the horse if they throw their head back this behaviour will very quickly become reinforced.

Figures 12-14; Instead start by stroking your hand down the cheek, the thumb can then by slid under the upper lip and lift it to assess the mucous membranes. If the horse does lift their head you are more likely to keep your hand in contact, thus not reinforcing the head lift.

Box 7 - Administration of oral medications

Figure 15; Again if the first thing the horse feels of the syringe is contact with the lips in an upwards direction they will not only find this aversive but if they throw their head back it will be impossible to keep the syringe in contact with the lips – negatively reinforcing the unwanted behaviour

Figures 16-18; Instead slide the syringe down the side of the horse's cheek. When you get to the lips angle it forwards and press the syringe down onto the lower lip, you can rotate your hand round so that the syringe points backwards and it will naturally slide back to sit on the tongue. Note in this scenario the horse has not lifted its head; if it were to, however, you would have a good change of

keeping the syringe in contact with the lips. You could then remove the syringe once the head was still (reinforcing the behaviour of head still rather than throwing the head back) and start to slide down again from the cheek.

Box 8 - Taking a Temperature

Figure 19; Grasping the tail and trying to insert the thermometer like this can be aversive and if the horse kicks you are stood in a precarious position

Figures 20-21; Instead stand close to the horses side, again you can scratch the wither your left hand. Slide your right hand back and start to scratch the area of hairless skin below the tail, this inevitably results in the horse voluntarily lifting the tail at which point you can easily insert the thermometer whilst still scratching the skin in the perineal region. Many horses thoroughly enjoy this!

References

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Figure Legends

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